

REMARKS:

PETITION FOR EXTENSION OF TIME

A petition for a three-month extension of time along with the requisite fee is submitted herewith.

AMENDMENTS TO THE CLAIMS

Claims **12-17, 19-36, and 38** were examined. Claims **12, 36, 37, and 38** are amended. The Applicant submits that these amendments merely make explicit that which was implicit in the claims as originally filed. As such, no new matter has been entered with these amendments. Furthermore, the Applicant submits that these amendments do not narrow the scope of any claim limitation within the meaning of the decision in *Festo*. No new subject matter has been introduced.

INTERVIEW SUMMARY

Applicant thanks the Examiner for the courteous interview of October 5, 2007 with Inventor Brian M. Sager and Attorneys Joshua D. Isenberg and Hao Y. Tung. The cited references were discussed in light of the pending claims. Agreement with respect to the claims was not reached.

CLAIM REJECTIONS

35 USC 112

Claims **12-17, 19-36, and 38** were rejected under 35 USC 112. Applicant submits that these rejections are now moot in light of the amendments made to the pending claims.

With regards to permeability recited in claims **12, 16, 17, and 36**, the claimed permeability is entirely enabled because increasing the tortuous path by providing additional layers is sufficient to decrease permeability. Support for this feature is found in paragraph [0013] of the published application, which corresponds to page 13, line 23 to page 4, line 2 of the specification as filed. This portion of the original specification discusses that the more layers, the more tortuous the path for permeating molecules. Thus, the more layers, the less permeable the barrier film 100 is to both water vapor and oxygen. Furthermore, the specification teaches at page 4, lines 22-27 that the oxygen permeability can be adjusted to be within specified ranges by “suitable choice of the number and composition of layers”. In addition, the original specification describes in coating and nanolaminate assembly in considerable detail beginning at page 6, line 8

and ending at page 7, line 8. In particular page 7, lines 6-8 teach that “[a] greater number of layers in the resulting barrier film can be obtained by repeating the coating and evaporation sequence multiple times and/or by depositing thicker coatings. Applicant submits that these combined teachings provide very clear guidance to one of skill in the art as to how to produce a nanolaminate barrier film with a desired water vapor permeability.

Thus, Applicant respectfully submits that these claims define an invention within the grasp of one of skill in the art. Per MPEP 2164.01, an analysis of whether a particular claim is supported by the disclosure in an application requires a determination of whether that disclosure, when filed, contained sufficient information regarding the subject matter of the claims as to enable one skilled in the pertinent art to make and use the claimed invention. Applicant respectfully submits that one of skilled in the art could arrive at the claimed permeability by increasing the number of layers to increase the tortuous path.

Per MPEP 2164.01(a), a conclusion of lack of enablement means that, based on the evidence regarding each of the above factors, the specification, at the time the application was filed, would not have taught one skilled in the art how to make and/or use the full scope of the claimed invention without undue experimentation. In re Wright, 999 F.2d 1557,1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993). Per MPEP 2164.04, the burden is on the Examiner to establish that the invention is not enabled based on the undue experimentation factors test set forth under MPEP 2164.01(a). Applicant respectfully requests that Office provide basis that there is undue experimentation required when the present application teaches that increasing the number of layers will decrease the permeability of the barrier film 100 is to water vapor and oxygen (see paragraph [0013]).

CLAIM 12 IS ALLOWABLE OVER BRINKER AND DAM

Claims **12-21**, **23-25**, **27-30**, and **34-35** were rejected under 35 USC 103(A) as being anticipated by U.S. Patent 6,264,741 to Brinker et al. (hereinafter “Brinker”) in view of European Patent No. 1225188 to Dams (hereinafter “Dams”). The Applicant respectfully overcomes the rejection.

Claim **12** has been amended to recite that the barrier film is a self-assembled structure wherein more layers of the organic polymer contain a superhydrophobic material, and that the covalent bond form in the self-assembled structure even in the presence of the superhydrophobic material in the one or more layers of the organic polymer. Support for self-assembled structure

is found in [0029] of the published application (corresponding to page 6, lines 17-25 of the specification as filed). Use of superhydrophobic material is discussed in paragraph [0012] (corresponding to page 3, lines 12-22 of the specification as filed). Support for covalent bonding is found in paragraph [0030] (corresponding to page 6, line 26 to page 7, line 8 of the specification as filed) and that superhydrophobic material may be used in the organic layers as discussed in paragraph [0012].

Applicant provides an affidavit under 37 CFR 1.132 regarding the nonobviousness of a self-assembled structure with superhydrophobic material as claimed. The affidavit is offered to show that using superhydrophobic material in the self assembled structure produces a surprising result. The self assembly process is based on a careful balance of hydrophilic and hydrophobic material, in order to cause the surfactant concentration to exceed the critical micelle concentration, resulting in micelle formation. The introduction of superhydrophobic material will disrupt the delicate balance of materials. As an initial matter, it is non-obvious that self-assembly can occur using a superhydrophobic material. Thus, to have a self-assembled structure formed using a superhydrophobic material as presently claimed is non-obvious.

There is no disclosure in Dams suggesting modifying the alternating layers to contain superhydrophobic material. Furthermore, in light of the supplied affidavit under 37 CFR 1.132, including a superhydrophobic material among the layers of organic material of the nanolaminate as claimed is believed to be non-obvious. As pointed out by the Office (Office Action of August 9, 2006 on page 5 lines 5-16), the traditional technique in the art as noted in the previously cited Singh reference is to change the inorganic layer by increasing the amount of silicate in the inorganic material to achieve good barrier properties (see Singh, page 64, lines 25-29). There is no teaching cited by the Office suggesting the modification of the organic layer to improve the moisture barrier qualities. Other than the teachings of the present application, Applicant fails to see where the Office has cited motivation to replace the multiple organic layers with that of Dams.

Even if Brinker were combined with Dams, the resulting device would not be the invention as set forth herein. The teachings of Dams merely suggest a surface application of its fluorochemical silane (see page 3, lines 20-25). Combining Brinker with Dams merely results in a top layer with Dams' fluorochemical silane, not incorporation of superhydrophobic material into the nanolaminate as presently claimed. As the cited references fail to show or suggest all

elements of the claimed invention, Applicant respectfully requests that the rejection to claim 12 be withdrawn.

Furthermore per MPEP 2145(X)(D)(3), **proceeding contrary to accepted wisdom is evidence of nonobviousness**. Absent the teachings found in Applicant's patent application, the Office has failed to cite the motivation for one of skill in art to modify the nacre-like material of Brinker to be a moisture barrier with the permeability as presently claimed. Applicant has proceeded against accepted wisdom by incorporating water barrier qualities into the presently claimed laminate and by starting with a poor moisture barrier material. Since Brinker desires to mimic nacre (which is easily hydrated after only five hours of soaking in water per Barthelat, "Tensile Testing of Abalone Nacre Miniature Specimens Using Microscopy and Speckle Correlation", page 2, col. 4, paragraph 2) and the Office has not provided any basis showing that Brinker layer is not somehow more of a moisture barrier than the material it seeks to copy, Applicant respectfully requests that the Office set forth the rationale for those of skill in the art to modify the nacre-like material of Brinker in view that doing so would be contrary to accepted wisdom by starting with water permeable material.

As the cited references fail to show or suggest the claimed invention, claim **12** and its dependent claims are now in condition for allowance. Claims **36** and **38** are believed to be allowable for substantially the same reasons set forth above. Additionally, claim **38** further recites that the film is at least 1000 nm thick comprised of individual layers, each roughly 1 nm thick (support found in paragraph [0030] of the published application) which is not shown or suggested by the cited art.

CONCLUSION

For the reasons set forth above, the Applicant submits that all claims are allowable over the cited art and define an invention suitable for patent protection. The Applicant therefore respectfully requests that the Examiner enter the amendment, reconsider the application, and issue a Notice of Allowance in the next Office Action.

Respectfully submitted,

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Date: February 22, 2008

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